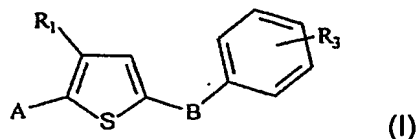


**CLAIMS**

1. Process for preparing 2,5-disubstituted 3-alkylthiophenes of formula



in which

A represents a  $\text{CH}_3$ ,  $\text{R}_2\text{CH}_2$ ,  $\text{HOCH}_2$  or  $\text{R}_2\text{CH}(\text{OH})$ - group,

B represents a  $\text{CHOH}$  or  $\text{CH}_2$  group,

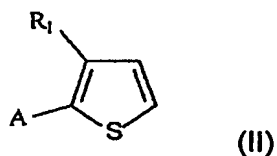
$\text{R}_1$  represents H or a  $\text{C}_1$ - $\text{C}_5$  alkyl group,

$\text{R}_2$  represents a  $\text{C}_1$ - $\text{C}_5$  alkyl group,

$\text{R}_3$  represents H or a  $\text{C}_1$ - $\text{C}_5$  alkyl group or a  $\text{C}_1$ - $\text{C}_5$  haloalkyl group, or a halogen chosen from fluorine, chlorine and bromine,

which comprises:

(a) the reaction of a compound of formula

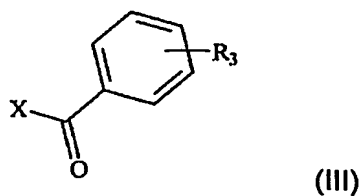


in which

A represents a  $\text{CHO}$ ,  $\text{CH}_3$ ,  $\text{R}_2\text{CH}_2$  or  $\text{R}_2\text{-CO-}$  group, and

$\text{R}_1$  and  $\text{R}_2$  have the meanings given above;

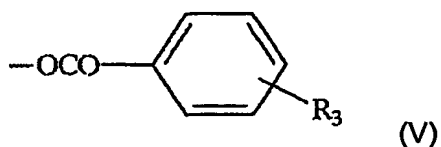
with a compound of formula



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in which

X represents OH, halogen or a group of formula



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or a group of formula



10

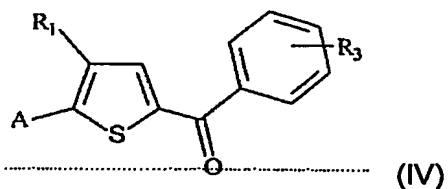
in which

R<sub>4</sub> represents a C<sub>1</sub>-C<sub>5</sub> alkyl, an optionally substituted benzyl or an optionally substituted aryl, and

R<sub>3</sub> has the meanings given above;

15

to give a compound of formula



in which

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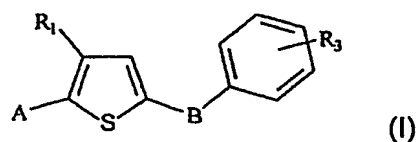
A, R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> have the meanings given above; and

(b) the reduction of the compound of formula IV thus obtained to give the compound of formula I.

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2. Process according to Claim 1 for the preparation of 2,5-disubstituted 3-alkylthiophenes of formula

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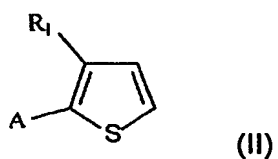
in which

A represents a  $\text{CH}_3$  or  $\text{R}_2\text{CH}_2$  group,

5

which comprises:

(a) the reaction of a compound of formula



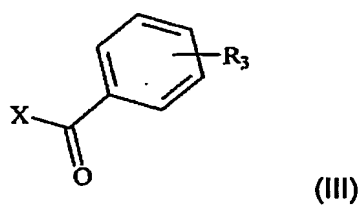
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in which

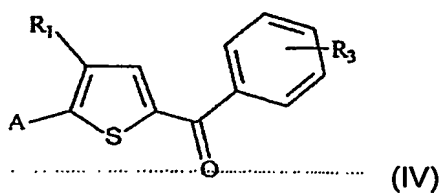
A represents a  $\text{CH}_3$  or  $\text{R}_2\text{CH}_2$  group,

with a compound of formula

15



to give a compound of formula



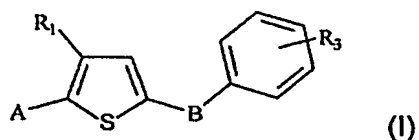
20

in which

A represents a  $\text{CH}_3$  or  $\text{R}_2\text{CH}_2$  group, and

(b) the reduction of the compound of formula IV thus obtained to give the compound of formula I.

- 5 3. Process according to Claim 1 for the preparation of 2,5-disubstituted 3-alkylthiophenes of formula

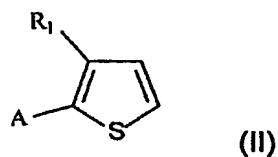


10 in which

A represents a  $\text{CH}_3$ ,  $\text{R}_2\text{CH}_2$ ,  $\text{HOCH}_2$  or  $\text{R}_2\text{CH}(\text{OH})$ - group,

which comprises:

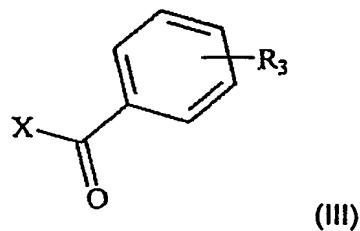
- 15 (a) the reaction of a compound of formula



in which

20 A represents a  $\text{CHO}$  or  $\text{R}_2\text{-CO-}$  group,

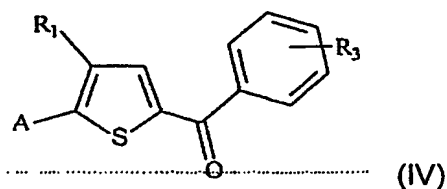
with a compound of formula



25

to give a compound of formula

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in which

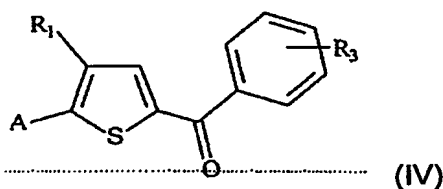
A represents a CHO or R<sub>2</sub>-CO group, and

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(b) the reduction of the compound of formula IV thus obtained to give the compound of formula I.

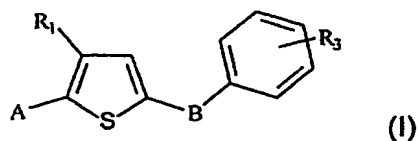
- 10 4. Process according to Claim 1 in which the reaction mentioned in point (a) is performed with a compound of formula III, in which X represents halogen, in the presence of a Lewis acid and in a solvent chosen from chlorinated solvents and deactivated aromatic solvents, preferably with benzoyl chloride, in the presence of AlCl<sub>3</sub> and in methylene chloride, in which the molar ratio of compound III/Lewis acid/compound II is between 0.9-1.5/0.9-1.5/1 and preferably about 1/1/1.
- 15

5. Process according to Claim 1, in which the reduction mentioned in point (b) is performed by means of a single reductive treatment of the compound of formula



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to give the compound of formula



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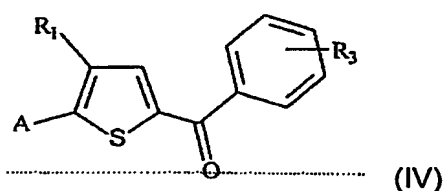
in which

A represents a CH<sub>3</sub> or R<sub>2</sub>CH<sub>2</sub> group, and

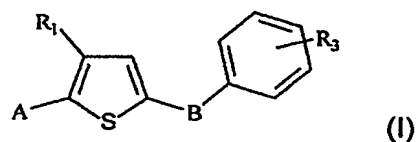
B represents a  $\text{CH}_2$  group.

6. Process according to Claim 5, in which the said reductive treatment is performed with sodium borohydride or sodium cyanoborohydride in the presence of trifluoroacetic acid.

7. Process according to Claim 1, in which the reduction mentioned in point (b) is performed by means of a first reduction reaction ( $b_1$ ) of the compound of formula



to give the hydroxylated intermediate compound of formula

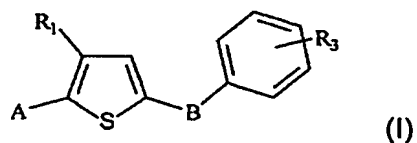


in which

A represents a  $\text{CH}_3$ ,  $\text{R}_2\text{CH}_2$ ,  $\text{HOCH}_2$  or  $\text{R}_2\text{CH}(\text{OH})$ - group, and

B represents a  $\text{CHOH}$  group;

optionally followed by a second reduction reaction ( $b_2$ ) of the said hydroxylated intermediate of formula I to give a final compound of formula

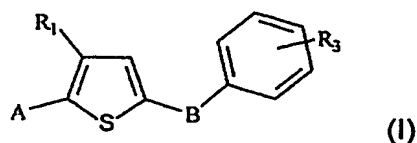


in which

A represents a  $\text{CH}_3$  or  $\text{R}_2\text{CH}_2$  group, and

B represents a  $\text{CH}_2$  group.

8. Process according to Claim 7, in which the reduction mentioned in point (b) is performed by means of the said reduction reactions ( $b_1$ ) and ( $b_2$ ) successively.
9. Process according to Claim 7, in which the first of the said reduction reactions ( $b_1$ ) is performed by treatment with metal hydrides, such as sodium borohydride, lithium aluminium hydride or boranes, or by treatment with aluminium isopropoxide, preferably by treatment with sodium borohydride.
10. Process according to Claim 7, in which the second of the said reduction reactions ( $b_2$ ) is performed by treatment with a borohydride in the presence of a strong acid, such as trifluoroacetic acid, methanesulphonic acid or sulphuric acid, or with zinc iodide or by catalytic hydrogenation, preferably by treatment with sodium borohydride and trifluoroacetic acid.
11. Process according to Claim 7, in which the second of the said reduction reactions ( $b_2$ ) is performed by catalytic hydrogenation of the hydroxylated intermediate of formula I ( $B=CHOH$ ) dissolved in a suitable solvent, such as an alcohol, for instance methanol, ethanol or isopropanol, preferably methanol, or in a mixture of water and alcohols, at a hydrogen pressure of between 1 and 10 bar, at a temperature of between 15 and 60°C, in the presence of a hydrogenation catalyst chosen from palladium and platinum, preferably palladium supported on an inert support such as carbon, alumina, silica or zeolites, preferably on carbon, in a neutral or acidic medium.
12. Process according to Claim 7, in which the said hydroxylated intermediate compound of formula

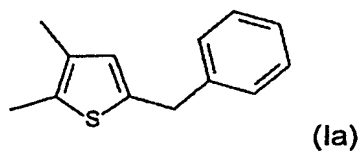


in which

- A represents a CH<sub>3</sub>, R<sub>2</sub>CH<sub>2</sub>, HOCH<sub>2</sub> or R<sub>2</sub>CH(OH)- group, and  
 B represents a CHOH group

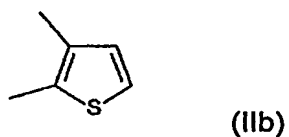
is purified by crystallization.

- 5 13. Process for preparing 2,3-dimethyl-5-benzylthiophene of formula



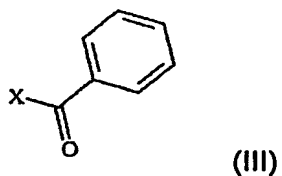
which comprises:

- 10 (a) the reaction of the compound of formula



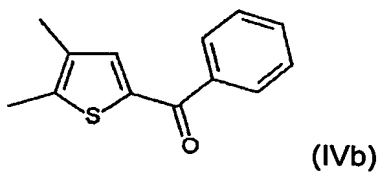
with a compound of formula

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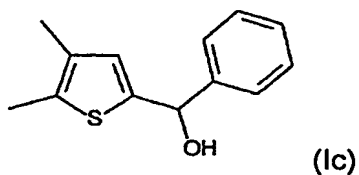
in which X represents halogen;

- 20 to give the compound of formula



- 25 (b<sub>1</sub>) the reduction of compound IVb to give the hydroxylated intermediate compound of formula





and

5

(b<sub>2</sub>) the reduction of the hydroxylated intermediate compound Ic to give 2,3-dimethyl-5-benzylthiophene (Ia).

10 14. Process according to Claim 13, in which the reactions mentioned in points (a), (b<sub>1</sub>) and (b<sub>2</sub>) are performed under the experimental conditions of Claims 4, 9 and 10, respectively.

15 15. Process according to Claim 13, in which the hydroxylated intermediate compound of formula Ic is purified by crystallization, preferably from n-heptane.